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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,718	01/07/2002	Patrick Chollet	Q66643	2215

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/501,718	Applicant(s) CHOLLET, PATRICK	
	Examiner Luz L. Alejandro	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13, 16-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuehnle et al., U.S. Patent 5,679,412 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972.

Kuehnle et al. shows the invention as claimed including a device for processing the surface of a container 10, in which the processing is accomplished by a low-pressure plasma, by excitation of a reaction fluid with microwave electromagnetic waves, the device for processing comprising: an enclosure in which the container is placed, the container having an elongated neck portion; inside of the enclosure, the microwaves are introduced by a coupling device; a cavity 52 which surrounds the container to delimit an internal cavity of the enclosure; a device 82 extending into the enclosure to hold the neck of the container; wherein the enclosure is a cylinder having a central axis such that the coupling device has a wave guide tunnel disposed outside of the tube and having a rectangular cross section, which extends towards the main axis of

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the enclosure and which is provided within a window of a wall of the enclosure; the wave guide tunnel projected on a plane tangent to the enclosure, the smaller dimension of the rectangle corresponds to its dimension along the direction of the axis of the enclosure (see, for example, figs. 1 and 6-7, and their descriptions).

Kuehnle et al. does not expressly disclose that the enclosure is made of a conductive material, or that the cavity is in the shape of a tube. With respect to the shape of the cavity being a tube, the configuration of the claimed cavity is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed cavity is significant. Regarding the enclosure being of a conductive material, Leprince et al. discloses a microwave plasma apparatus in which the enclosure is made of a conductive material (see, for example, col. 2, lines 66-68). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Kuehnle et al. as to comprise an enclosure made of a conductive material, because such material is known to be suitable and used in the art for the enclosure of a microwave plasma apparatus.

Kuehnle et al. and Leprince et al. do not expressly disclose the electric field resulting from the propagation of the microwaves has an axial symmetry with respect to the central axis of the enclosure, the claimed inside diameters of the enclosure and the claimed variations of intensity of the electrical field. However, Sato et al. discloses a microwave apparatus that has an axial symmetry with respect to the central axis of the enclosure (see figs. 3A-3B and their descriptions), as does Watanabe et al. (see fig. 3

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and its description) and Ishii (see figs. 3A-3B and their descriptions). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Kuehnle et al. modified by Leprince et al. so as to have an electric field resulting from the propagation of the microwaves to have an axial symmetry with respect to the central axis of the enclosure because such an electric field distribution enables a uniform plasma.

Kuehnle et al., Leprince et al., Sato et al., Watanabe et al. and Ishii do not expressly disclose the claimed inside diameters of the enclosure and the dimensions of the wave guide tunnel, however, a prima facie case of obviousness still exists because it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to select/optimize the inside diameter of the enclosure and the dimensions of the wave guide tunnel, as claimed depending on the object to be processed and/or the coupling mode required, and such limitation would not lend patentability to the instant application absent the showing of unexpected results. Furthermore, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. Also, note that the claimed variations of the intensity of the electrical field will be achieved depending on the dimension of the enclosure, and the wavelength of the microwave.

With respect to claims 10-11 and 13, such limitations are not given patentable weight in apparatus claims because they are directed to the material or article worked

upon and therefore do not limit the apparatus claims. Furthermore, note that the apparatus of Kuhnle et al. modified by Leprince et al., Sato et al., Watanabe et al., and Ishii is capable of processing a container that comprises a processed inner and/or outer face(s) and/or a container that comprises a material deposited by low-pressure plasma.

Regarding claim 12, note that inside the enclosure of the apparatus of Kuehnle et al., the cavity 52 is delimited by a wall made of a material that is transparent to the microwaves (see, for example, fig. 6).

With respect to claim 16, the container is disposed so that its bottom is spaced apart from the enclosure.

Moreover, concerning claims 17 and 19, the waveguide is in the form of a rectangle having a uniform rectangular cross section and the cavity is coaxially disposed with respect to the enclosure.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuehnle et al., U.S. Patent 5,679,412 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Ohkawa, U.S. Patent 5,225,740.

Kuehnle et al., Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose the cavity being composed of quartz. Ohkawa discloses quartz being used as a microwave transmission material (see col. 8-lines 19-23). In view of this disclosure, it would have been obvious to one of ordinary skill in the

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art at the time the invention was made to modify the apparatus of Kuehnle et al. modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to use quartz as the cavity material because it is shown by Ohkawa to be transmissive to microwaves.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuehnle et al., U.S. Patent 5,679,412 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Doehler et al., U.S. Patent 4,893,584 or Saito et al., U.S. Patent 4,831,963.

Kuehnle et al., Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose wherein the waveguide protrudes past a wall of the enclosure towards the container. Doehler et al. discloses a microwave waveguide 42 that protrudes past a wall of an enclosure 12 (see fig. 1 and its description). Alternatively, Saito et al. also discloses a microwave waveguide 5 that protrudes past a wall of an enclosure 1 (see fig. 6 and its description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Kuehnle et al. modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to have the waveguide structure of Doehler et al. or Saito et al. because in such a way a substantially uniform plasma can be produced in the apparatus.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuehnle et al., U.S. Patent 5,679,412 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Tanaka et al., U.S. Patent 4,970,435.

Kuehnle et al., Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose a generator which produces the electromagnetic waves, and the generator is disposed to protrude into the waveguide tunnel. Tanaka et al. discloses a generator 11 which produces the electromagnetic waves, and the generator is disposed to protrude into the waveguide tunnel (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Kuehnle modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to comprise the waveguide generator structure of Tanaka et al. because such a structure is an efficient and effective means to generate microwave plasma in a processing chamber.

Claims 1-13, 16-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plester, U.S. Patent 5,849,366 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972.

Plester shows the invention as claimed including a device for processing the surface of a container 2, in which the processing is accomplished by a low-pressure

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plasma, by excitation of a reaction fluid with microwave electromagnetic waves, the device for processing comprising: an enclosure in which the container is placed, the container having an elongated neck portion; inside of the enclosure, the microwaves are introduced by a coupling device 7; a cavity which surrounds the container to delimit an internal cavity of the enclosure; a device extending into the enclosure to hold the neck of the container; wherein the enclosure is a cylinder and its central axis is a main axis of the container such that the coupling device has a wave guide tunnel which is disposed outside the cavity and having a rectangular cross section, which extends towards the main axis of the enclosure and which is provided within a window of a wall of the enclosure; the wave guide tunnel projected on a plane tangent to the enclosure, and is rectangular in shape, the smaller dimension of the rectangle corresponds to its dimension along the direction of the axis of the enclosure (see, for example, figs. 1, 2A and 2C, and their descriptions).

Plester does not expressly disclose that the enclosure is made of a conductive material or that the cavity is in the shape of a tube. With respect to the shape of the cavity being a tube, the configuration of the claimed cavity is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed cavity is significant. Leprince et al. discloses a microwave plasma apparatus in which the enclosure is made of a conductive material (see, for example, col. 2, lines 66-68). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Plester as to comprise an enclosure

made of a conductive material, because such material is known to be suitable and used in the art for the enclosure of a microwave plasma apparatus.

Plester and Leprince et al. do not expressly disclose the electric field resulting from the propagation of the microwaves has an axial symmetry with respect to the central axis of the enclosure, the claimed inside diameters of the enclosure and the claimed variations of intensity of the electrical field. However, Sato et al. discloses a microwave apparatus that has an axial symmetry with respect to the central axis of the enclosure (see figs. 3A-3B and their descriptions), as does Watanabe et al. (see fig. 3 and its description) and Ishii (see figs. 3A-3B and their descriptions). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Plester modified by Leprince et al. so as to have an electric field resulting from the propagation of the microwaves to have an axial symmetry with respect to the central axis of the enclosure because such an electric field distribution enables a uniform plasma.

Plester, Leprince et al., Sato et al., Watanabe et al. and Ishii do not expressly disclose the claimed inside diameters of the enclosure and the dimensions of the wave guide tunnel, however, a prima facie case of obviousness still exists because it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to select/optimize the inside diameter of the enclosure and the dimensions of the wave guide tunnel, as claimed depending on the object to be processed and/or the coupling mode required, and such limitation would not lend patentability to the instant application absent the showing of unexpected results.

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Furthermore, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. Also, note that the claimed variations of the intensity of the electrical field will be achieved depending on the dimension of the enclosure and the wavelength of the microwave.

With respect to claims 10-11 and 13, such limitations are not given patentable weight in apparatus claims because they are directed to the material or article worked upon and therefore do not limit the apparatus claims. Furthermore, note that the apparatus of Plester et al. modified by Leprince et al., Sato et al., Watanabe et al., and Ishii is capable of processing a container that comprises a processed inner and/or outer face(s) and/or a container that comprises a material deposited by low-pressure plasma.

Regarding claim 12, note that inside the enclosure of the apparatus of Plester, a cavity is delimited by a wall made of a material that is transparent to the microwaves (see, for example, fig. 2A or fig. 2C).

With respect to claim 16, the container is disposed so that its bottom is spaced apart from the enclosure.

Moreover, concerning claims 17 and 19, the waveguide is in the form of a rectangle having a uniform rectangular cross section and the cavity is coaxially disposed with respect to the enclosure.

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Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plester, U.S. Patent 5,849,366 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Ohkawa, U.S. Patent 5,225,740.

Plester, Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose the cavity being composed of quartz. Ohkawa discloses quartz being used as a microwave transmission material (see col. 8-lines 19-23). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Plester modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to use quartz as the cavity material because it is shown by Ohkawa to be transmissive to microwaves.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plester, U.S. Patent 5,849,366 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Doehler et al., U.S. Patent 4,893,584 or Saito et al., U.S. Patent 4,831,963.

Plester, Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose wherein the waveguide protrudes past a wall of the enclosure towards the container. Doehler et al. discloses a microwave waveguide 42 that protrudes past a wall of an enclosure 12 (see fig. 1 and its description).

Alternatively, Saito et al. also discloses a microwave waveguide 5 that protrudes past a wall of an enclosure 1 (see fig. 6 and its description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Plester modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to have the waveguide structure of Doehler et al. or Saito et al. because in such a way a substantially uniform plasma can be produced in the apparatus.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plester, U.S. Patent 5,849,366 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Tanaka et al., U.S. Patent 4,970,435.

Plester, Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose a generator which produces the electromagnetic waves, and the generator is disposed to protrude into the waveguide tunnel. Tanaka et al. discloses a generator 11 which produces the electromagnetic waves, and the generator is disposed to protrude into the waveguide tunnel (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Plester modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to comprise the

waveguide generator structure of Tanaka et al. because such a structure is an efficient and effective means to generate microwave plasma in a processing chamber.

Claims 1-13, 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laurent, WO 99/17334 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972.

Laurent shows the invention as claimed including a device for processing the surface of a container 1, in which the processing is accomplished by a low-pressure plasma, by excitation of a reaction fluid with microwave electromagnetic waves, the device for processing comprising: an enclosure in which the container is placed, the container having an elongated neck portion; inside of the enclosure, the microwaves are introduced by a coupling device 4; a cavity 10 which surrounds the container to delimit an internal cavity of the enclosure; a device extending into the enclosure to hold the neck of the container; wherein the enclosure is a cylinder having a central axis, the coupling device has a wave guide tunnel which is provided outside of the cavity and which is provided within a window of a wall of the enclosure (see, for example, figs. 1-4, and their descriptions).

Laurent does not expressly disclose that the wave guide tunnel has a rectangular cross section or the cavity is in a tube shape, the wave guide tunnel projected on a plane tangent to the enclosure, and the smaller dimension of the rectangle corresponds to its dimension along the direction of the axis of the enclosure. However, the

configuration of the claimed waveguide and cavity is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed wave guide and cavity are significant.

Laurent does not expressly disclose that the enclosure is made of a conductive material. Leprince et al. discloses a microwave plasma apparatus in which the enclosure is made of a conductive material (see, for example, col. 2, lines 66-68). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Laurent as to comprise an enclosure made of a conductive material, because such material is known to be suitable and used in the art for the enclosure of a microwave plasma apparatus.

Laurent and Leprince et al. do not expressly disclose the electric field resulting from the propagation of the microwaves has an axial symmetry with respect to the central axis of the enclosure, the claimed inside diameters of the enclosure and the claimed variations of intensity of the electrical field. However, Sato et al. discloses a microwave apparatus that has an axial symmetry with respect to the central axis of the enclosure (see figs. 3A-3B and their descriptions), as does Watanabe et al. (see fig. 3 and its description) and Ishii (see figs. 3A-3B and their descriptions). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Laurent modified by Leprince et al. so as to have an electric field resulting from the propagation of the microwaves to have an

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axial symmetry with respect to the central axis of the enclosure because such an electric field distribution enables a uniform plasma.

Laurent, Leprince et al., Sato et al., Watanabe et al. and Ishii do not expressly disclose the claimed inside diameters of the enclosure and the dimensions of the wave guide tunnel, however, a prima facie case of obviousness still exists because it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to select/optimize the inside diameter of the enclosure and the dimensions of the wave guide tunnel, as claimed depending on the object to be processed and/or the coupling mode required, and such limitation would not lend patentability to the instant application absent the showing of unexpected results. Furthermore, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. Also, note that the claimed variations of the intensity of the electrical field will be achieved depending on the dimension of the enclosure and the wavelength of the microwave.

With respect to claims 10-11 and 13, such limitations are not given patentable weight in apparatus claims because they are directed to the material or article worked upon and therefore do not limit the apparatus claims. Furthermore, note that the apparatus of Laurent et al. modified by Leprince et al., Sato et al., Watanabe et al., and Ishii is capable of processing a container that comprises a processed inner and/or outer face(s) and/or a container that comprises a material deposited by low-pressure plasma.

Regarding claim 12, note that inside the enclosure of the apparatus of Laurent, a cavity is delimited by a wall 10 made of a material that is transparent to the microwaves, and the container 1 is received inside the cavity.

With respect to claim 16, the container is disposed so that its bottom is spaced apart from the enclosure.

Moreover, concerning claims 17 and 19, the waveguide is in the form of a rectangle having a uniform rectangular cross section and the cavity is coaxially disposed with respect to the enclosure.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laurent, WO 99/17334 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Ohkawa, U.S. Patent 5,225,740.

Laurent, Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose the cavity being composed of quartz. Ohkawa discloses quartz being used as a microwave transmission material (see col. 8-lines 19-23). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Kuehnle et al. modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to use quartz as the cavity material because it is shown by Ohkawa to be transmissive to microwaves.

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Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laurent, WO 99/17334 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Doehler et al., U.S. Patent 4,893,584 or Saito et al., U.S. Patent 4,831,963.

Laurent, Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose wherein the waveguide protrudes past a wall of the enclosure towards the container. Doehler et al. discloses a microwave waveguide 42 that protrudes past a wall of an enclosure 12 (see fig. 1 and its description). Alternatively, Saito et al. also discloses a microwave waveguide 5 that protrudes past a wall of an enclosure 1 (see fig. 6 and its description). In view of these disclosures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Kuehnle et al. modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to have the waveguide structure of Doehler et al. or Saito et al. because in such a way a substantially uniform plasma can be produced in the apparatus.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laurent, WO 99/17334 in view of Leprince et al., U.S. Patent 5,063,330 and Sato et al., U.S. Patent 5,961,776 or Watanabe et al., U.S. Patent 6,158,383 or Ishii, U.S. Patent 6,827,972 as applied to claims 1-13, 16-17, and 19 above, and further in view of Tanaka et al., U.S. Patent 4,970,435.

Laurent, Leprince et al., Sato et al., Watanabe et al., and Ishii are applied as above but do not expressly disclose a generator which produces the electromagnetic waves, and the generator is disposed to protrude into the waveguide tunnel. Tanaka et al. discloses a generator 11 which produces the electromagnetic waves, and the generator is disposed to protrude into the waveguide tunnel (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Kuehnle modified by Leprince et al., Sato et al., Watanabe et al., and Ishii so as to comprise the waveguide generator structure of Tanaka et al. because such a structure is an efficient and effective means to generate microwave plasma in a processing chamber.

Response to Arguments

Applicant's arguments filed 4/5/07 have been fully considered but they are not persuasive. Applicant argues that none of the references disclose the combination of an enclosure and a tube as required by the claims. However, the examiner respectfully submits, as stated in the above rejections, that each of the Kuehnle et al., Plester, and Laurent references disclose the limitation of the cavity, as previously disclosed in dependent claim 12. With respect to the cavity being in the shape of a tube, the configuration of the claimed cavity is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed cavity is significant.

Conclusion

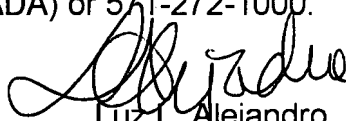
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Luz L. Alejandro
Primary Examiner
Art Unit 1763

June 7, 2007